

AMENDMENTS TO THE CLAIMS

Claim 1 (Original) A separation system comprising:

a distillation column into which a mixture of a first component mainly comprising water and a second component mainly comprising nonaqueous substances is supplied;

a separator including a separation membrane for separating overhead vapor discharged from a top of said distillation column into a permeable vapor which mainly comprises said first component and a nonpermeable vapor which mainly comprises said second component by allowing only a selected portion of said overhead vapor to permeate said separation membrane; and

a reflux unit for cooling a portion of said overhead vapor into a liquid and returning the liquid thus obtained into an upper portion of said distillation column.

Claim 2 (Original) The separation system of claim 1 wherein said distillation column includes fluidized beds.

Claim 3 (Original) A separation system comprising:

a distillation column into which a mixture of a first component mainly comprising water and a second component mainly comprising nonaqueous substances is supplied;

a first separator including a first separation membrane for separating overhead vapor discharged from a top of said distillation column into a first permeable vapor which mainly comprises said first component and a first nonpermeable vapor which mainly comprises said second component by allowing only a selected portion of said overhead vapor to permeate said first separation membrane; and

a second separator including a second separation membrane for separating said first permeable vapor into a second permeable vapor which mainly comprises said first component and is higher in the concentration of said first component than said first permeable vapor, and a second nonpermeable vapor which mainly comprises said second component, by allowing only a selected portion of said first permeable vapor to permeate

said second separation membrane.

Claim 4 (Original) A reactor system comprising:

a reactor for producing an aromatic carboxylic acid and water from an alkyl aromatic compound in a solvent containing acetic acid, and for generating a vapor mixture of a solvent and water;

a first separation membrane for separating said vapor mixture, which is discharged from said reactor, into a first permeable vapor mainly comprising a first component and a first nonpermeable vapor mainly comprising a second component;

a second separation membrane for separating said first permeable vapor, which is discharged from said first separation membrane, into a second permeable vapor mainly comprising the first component and a second nonpermeable vapor mainly comprising the second component; and

a return passage for condensing said first nonpermeable vapor and said second nonpermeable vapor and returning the thus condensed first and second nonpermeable vapor into said reactor.

Claim 5 (Original) The reaction system of claim 4 wherein said solvent containing acetic acid is acetic acid, said alkyl aromatic compound is paraxylene, and said aromatic carboxylic acid is terephthalic acid.

Claim 6 (Previously Presented) The reactor of claim 4 further comprising gas-liquid separators each provided between one of said first and second separation membranes and said return passage for separating terephthalic acid from said first and second nonpermeable vapors.

Claim 7 (Previously Presented) The reactor of claim 1 wherein said separation membrane or said first and second separation membranes comprise an inorganic porous

member carrying in pores thereof a silica gel obtained by hydrolyzing an alkoxysilane containing ethoxy groups or methoxy groups.

Claims 8-19 (Canceled)